

II.

ON SOME ROCK-MARKINGS. BY PROFESSOR DUNS, D.D., F.S.A. SCOT.
(PLATES III., IV.)

The object I have chiefly in view in this paper is to call the attention of archæologists to some natural phenomena, disregard of which may weaken inferences otherwise valid and interesting. The subject was suggested by a conversation which followed the reading of a paper at a recent meeting of the Society. But I am anxious, in the outset, to say that the remarks which follow are in no sense controversial. Perhaps I may best introduce the subject by following the good old Socratic method of questioning. In this way I may be able to indicate the topics to be touched, the extent of the field of survey, the points at which observers might be tempted to stray outside of scientific lines of study, and withal our present ignorance of the true import of some matters of interest that have long been under the eye of the archæologist. It may be asked then, Are the figures of rock-markings which occur in the Society's *Proceedings*, say, from 1867, when Sir James Simpson's *British Archaic Sculpturings* was published as an appendix to the volume for that year, authentic? That is, are they fair copies of the originals? If so, do not even these figures themselves beget the suspicion that the originals are not all artificial? Assuming this, are there marks of which the natural and the artificial can be distinguished and explained? Were we to differentiate the cups and rings from other markings, are there trustworthy data for a classification, according to variations of form, in cups, rings, and canals? Or do most of these variations accompany the natural markings? If they occur entirely in rocks *in situ*, but also on travelled stones, small or great, on standing stones, on the upper or under sides of the covers of stone cists—does the position influence the form? Have we reliable materials for generalisations (*a*) as to their age, (*b*) as to their meaning, and (*c*) as to the limits of their distribution?

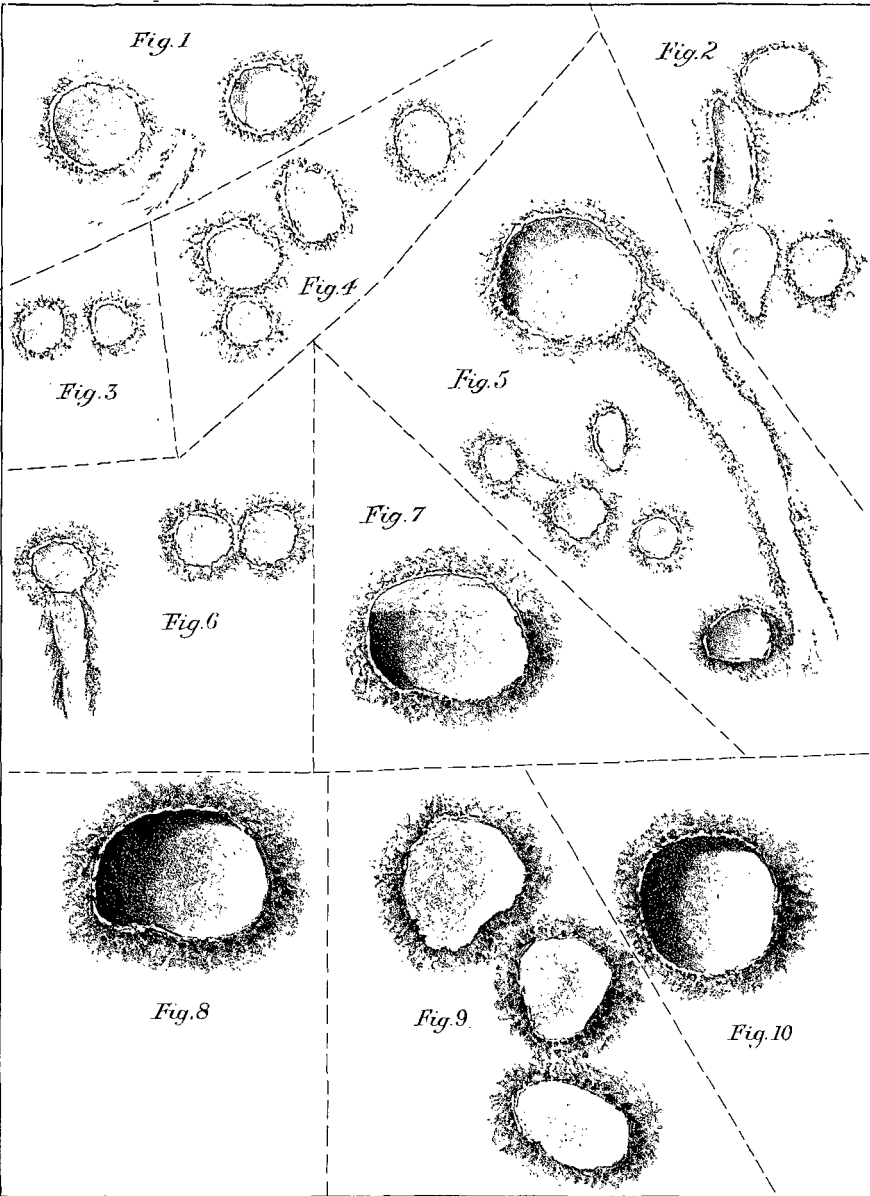
These questions suggest points of much importance to scientific

archæologists when investigating rock-markings, in the hope of finding helps to the history of tribes who may have had no other records, or even of tribes who may have other records. Errors of observation in any one line of research reflect, more or less, on all the other lines, and bring discredit on true methods. The subject of the present paper, though in itself of trivial importance, thus assumes relations which make it worthy of notice. It may indeed be cumbered with hypotheses, but these may be of the highest use as working instruments, provided they are ever directed towards verification by observation. But this, as in the matter before us, implies some knowledge of other branches than archæology. Mistakes are made by the mere specialist, which students of wider, though it may be in the one branch of far less profound culture, are not likely to make. The progress of archæology means the increase of the points of contact and interaction between it and other branches of the sciences of observation. It has problems to be solved, and fields to be surveyed, which can never be adequately done without the help of the botanist, the zoologist, and the geologist. The subject before us is a case in point.

I have gone carefully over all the papers on, and the references to, cup-markings in the Society's *Proceedings* since 1867, about twenty papers in number, running from a couple of pages to a hundred. This is mentioned with the view of indicating the prominent place which the subject has occupied in the work of the Society. And the literature now referred to has confirmed an impression, formed when hearing some of the papers read, that the process of verification has not kept pace with that of description. That many of the markings are natural seems to be beyond all doubt. Was there a suspicion of this in the mind of the describer; and if so, what were the means used to test his observations? If no such suspicion was felt, was the observer acquainted with the forces which are everywhere altering the surfaces of rocks *in situ*, and of large lumps detached from the rocks, and now met with as boulders? A good many of the records fail in not giving the mineral character of the stones on which the markings occur. The species named are granite, gneiss, porphyry, whin, diorite, mica-schist, primitive limestone, and sandstone — minerals peculiarly liable to present cup-like marks and

canals, not, however, differing in this respect from quartzites, clay-slates, carboniferous limestone, &c.

The rubbings and the rock specimens of natural markings which are now shown to the Society were not obtained with any thought of the purpose for which they are now used, but simply to illustrate aspects of weathering referred to year by year in lecturing to my own students. The first examples which specially struck me occurred in the face of a mass of nodular felsite near Bettwys-Y-Coed, North Wales, but not so much from the archæological as the geological point of view. Archæologically, the felsite present is a memory rather than an observation; geologically, it presented a feature of much interest, for, on knocking out a nodule, I found the nodule to be in nothing distinguishable from the mass of which it formed part. The rock belongs to the Bala series. I noticed similar features in another Silurian rock, more recently at Aberystwith, in which almost perfectly spherical nodules (one of which I show) sparsely occur—water-worn, one might almost say, but not in the present sea—though, as they are identical in grain with their matrix, they may have been formed, as sub-circular balls have been in our own sandstones, by loose material blown into, or floated into, corresponding holes on a half-dried shore. After a well-known fashion, the gradual deposits in the hollow would, when in after ages exposed to weathering influences, give a cup and ring mark. This indeed may be seen any day in many of the flagstones which form our footways—cups with rings, cups with canals, solitary cups, and even confluent cups like footprints. Now, when these flagstones were laid down they, no doubt, presented a perfectly level surface, but the fact that the material which had originally filled the holes was looser than the body of the rock in which they had been formed, made them yield more readily to weathering and to the feet of passers-by than the general surface of the stone itself would have done. Corresponding features may be noticed in Caithness flags, in connection with the presence of nodules, generally lighter in colour and harder in grain than the flags themselves. In the field, under the influence of a variety of forces, the geologist meets with many such marks, and they occur also in conditions where weathering cannot touch them, assuming, however, forms which may come into close relation with archæology. In



ROCK MARKINGS, BEN NEVIS, INVERNESS-SHIRE.

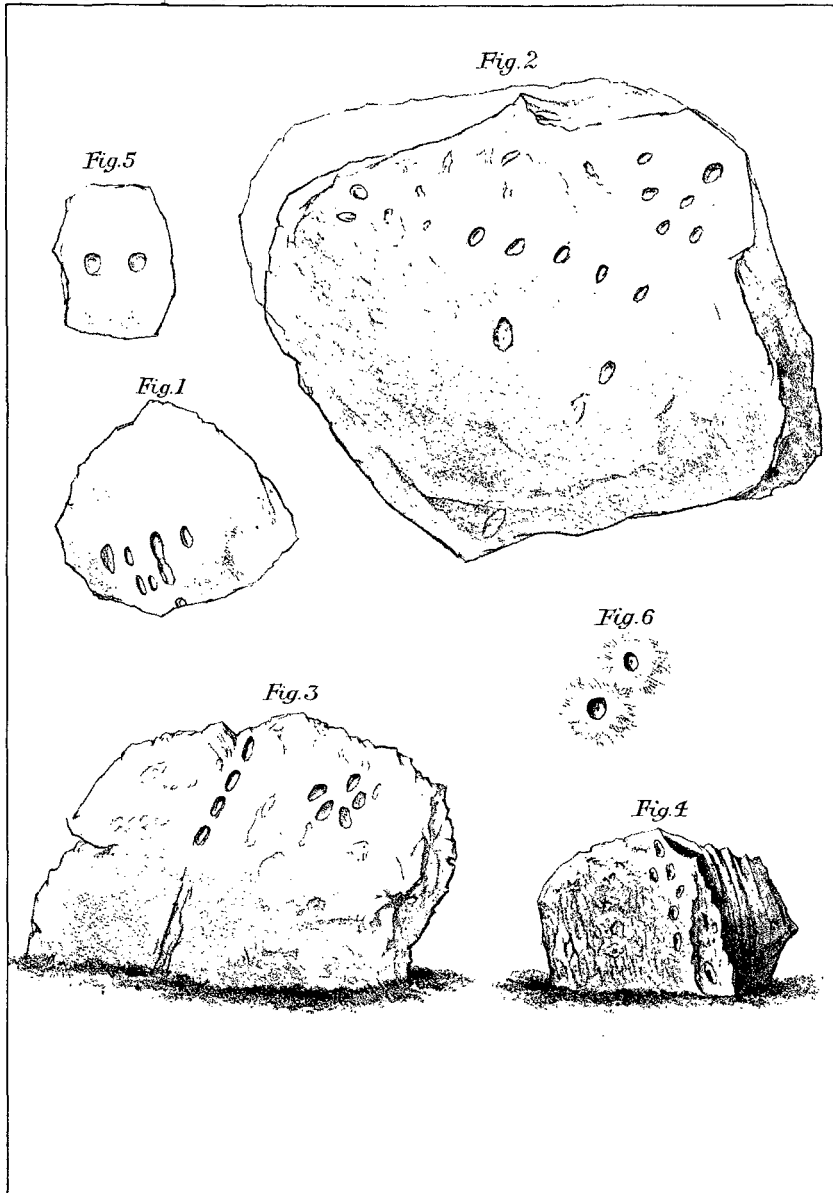
1874, John Macfie, Esq., Hope Terrace, Edinburgh, informed me that, in the sinking of a well in Vernon Street, Liverpool, lumps of sandstone were taken out which contained loose discs of a peculiar kind. He obtained a number of specimens for me, several of which are on the table. Had the surface of this work been exposed to the atmosphere, it would have presented hollows corresponding to these discs.

Every geologist knows that igneous and metamorphic rocks which present much surface to the air, the heat of the sun, and the biting frost, bear many marks corresponding to some of those mentioned. Great masses of igneous rocks are seldom homogeneous. Most lavas are found to have entangled mineral fragments lithologically different from the mass, while all may have constituents less or more easily acted on by the atmosphere. And nowhere have I seen the phenomena so well marked as in the Ben Nevis range, where, as a member of the Boulder Committee of the Royal Society of Edinburgh, I worked recently for two months. In a paper read by me to the Society in 1881, the following sentences occur:—"Two large boulders of the same mineral (coarse gneiss) lie in front of this—one to north-west, the other to south-west. They are smoothly rounded, and show in a pretty way the contorted twistings into which the original lines of bedding have been forced. On the north aspect of one of these stones are several round hollows, so very like the cup-markings of the archæologist that I was about to conclude that they were artificial, when, seeing on another stone a bit standing out from the surface, I struck it with my hammer, and it fell out, leaving the cup-mark on the stone." The bit now shown has a shallow cup in it, and when this was in its place the depression was surrounded by a well-marked ring. The rubbings of natural cups, represented in Plate III. figs. 1-10, were made from various travelled stones met with in my wanderings. One huge boulder on which some of those, I had almost said, characteristic markings with clean sharp edges occur, seemed as if it had been worked smooth on one side and had continued smooth, resisting the teeth of time. It is lithologically the same as the neighbouring rock, and has not travelled, for the comparatively smooth surface may be the effect of ice-rubbing or the result of cleavage. In the case of gneiss of uniform composition, the lines of cleavage are not

unfrequently at right angles to the original bedding, and, if there has not been much contortion, this surface does not weather rapidly; while in the case of granites, porphyries, and quartz, the cleavage-force may cut immense masses as clean as a sharp knife will do an apple. The specimens on the table show this.

When in Orkney, in the summer of 1877, I gave a good deal of time to the examination of the rocks lying between Stromness and the old churchyard, chiefly with reference to the fossil fishes they contain. The rubbings of the cups, with their connecting canal now shown, were made on the slope of these rocks towards the sea. What are they? I have a theory which need not be stated here. They are referred to simply to say that, with better reason than some illustrative figures in the literature of this subject, they might be held to represent artificial markings—cups and canals. I had not, however, even the remotest thought of this when the rubbings were made. In the course of geological work in another and widely different district, I met with cups which for a time deceived me. When following the famous limestones of the English Lake District between Grange-over-Sands and Coniston, I visited Dalton Quarry, situated between the former place and Ulverstone, and there, on the face of a large mass of rock which had been exposed for a considerable time, were some marks which I at once concluded were cup-marks; and, having made up my mind as to this, I was specially struck with the fact that in all of them there seemed strangely to be a tendency to form a canal in the direction opposite to the slope. But, before leaving the quarry, the markings were explained. These depressions were only the marks of positions that had been occupied by fossil *Productidæ*—the shells having been separated by the workmen from the matrix in which they were found. The specimen now on the table affords an admirable illustration of this. The split, revealing cup and ball, was made by two or three strokes of my geological hammer.

I am glad in this connection to quote the opinion of an able and accurate observer strongly corroborative of the evidence now submitted, as to the natural character of many of the markings which we might be tempted to set down as artificial. Dr D. Christison writes to me on the



ROCK MARKINGS, PEEBLES-SHIRE.

subject from Peebles, and forwards the drawings now submitted to illustrate his remarks.

"Happening," says Dr Christison, "to hear from Dr Joseph Anderson, that you intended to read a paper at the next meeting of the Antiquarian Society, upon markings on stones which were liable to be mistaken for 'cup-markings,' it occurred to me that you might like to see some notes and drawings of mine taken recently in this county bearing on the subject."

Plate IV. fig. 1. "The markings on this smooth-surfaced flat stone, near Tinnis Castle, could hardly be mistaken for cup-marks, but they have a singularly artificial look, particularly the one which so much resembles a slenderly-formed human foot; nevertheless, I think, there can be no doubt they are of natural origin, and the foot-like one is evidently formed by the gradual union of two cavities, through disintegration of the stone surface between them. Thus the rise of the instep is given, which contributes to the illusion."

Plate IV. fig. 2, "represents the markings on a large and conspicuous flat rock at the foot of the eminence on which stand the ruins of Tinnis Castle, and the remains of a prehistoric fort. The surface of the rock, which measures about 9 feet by 9 feet, is very rough and worn, although tolerably flat on the whole, but the oblong rounded cavities represented come out very distinctly amidst the other irregularities of the surface, when a good light is obtained. The regularity of their disposition in groups suggests strongly an artificial origin, but I take them to be natural, because they are oblong in form, shallow in depth, and because two of them, represented with darker shade than the rest, are, on the other hand, deep with perpendicular walls."

Plate IV. fig. 3, "also at Tinnis, is a very rough weathered block among many others. On the perpendicular side shown, which is 5 feet in height, are four cavities which, although not cup-shaped, must, one would think, be artificial from their perfectly linear distribution and similarity of form. But they occur in a kind of incipient furrow in the stone, which becomes more distinct lower down, and may possibly be produced by disintegration of the rock at a weak place. Besides these markings, there is a tendency to the formation of shallow cavities on the

general surface of the stone, five of which, more distinct than any of the others, assume the regular form shown in the drawing."

Plate IV. fig. 4. "At Rachanhill Fort, is a boulder, polished and glacier-scratched on the opposite side to the one shown. A large part (where the shading is) has been broken off. Eight rough, irregular, oblong, deep cavities are shown in the sketch. Two of these have besides a deep narrow slit at the bottom. I think these cavities must be artificial, the deep slits at the bottom of two of them being perhaps due to subsequent disintegration, but they are not 'cup-markings.'"

Plate IV. fig. 5, "represents what may be two true 'cups' on a flat stone, lying on a deep slope of the old fort at Lour, opposite Stobo Station. They are about $2\frac{3}{4}$ inches diameter and 1 inch deep. Perhaps a modern origin is suggested by the perfect regularity of their form and of their position on the stone."

Plate IV. fig. 6, "shows two regularly formed cups in a stone among the ruins of the so-called 'Macbeth's Castle,' Manor. One is 4 and the other 2 inches in diameter. I should have pronounced them to be true cups, were it not that at the bottom of each there is a hole, large enough to admit the forefinger, and in the case of the smaller cup this hole, 2 inches in depth, took a curved course, which could hardly have been made by art."

In volume vii. of the *Natural History Transactions of Northumberland, &c.*, there is an interesting paper on "Tynedale Escarpments," by Hugh Miller, Esq., F.G.S., in which there are some singularly suggestive references to this subject. Mr Miller not only indicates how the temptation to mistake the natural for the artificial may arise, but he explains it in such a way as to excuse the observers. There is, he shows, a fundamental similarity between many of the natural and artificial markings. Both are distributed singly or in groups; in both there may be a canal, which follows the slope of the stone; and both are frequently confluent. Mr Miller's paper also contains much valuable information on weathering.

Dr Christison is inclined to believe that the two true cups to which he refers may be of modern origin, from the perfect regularity of their form. In a word, they may not have been long enough in the stone to have

suffered in shape by weathering influences. The hint is a useful one. "Three years ago," says Sir James Simpson, "my friend Dr Arthur Mitchell saw the herring fishermen (at Fetheland), in a day of idleness, cutting circles with their knives in the face of a rock, without the operators being able to assign any reason for their work, except that others had done it before them" (*British Archaic Sculpturings*, p. 122). The importance of taking into account the element of time will be readily seen. In the early part of this century granites were pointed out in Scandinavia on which were runes thought to be more than two thousand years old. These examples were regarded as unquestionable evidence that the waste of granite by weathering had not been what some geologists alleged. The only reply was, "You do not know how deep the lettering may have been originally." Curiously enough, no question was asked as to the age of the runes themselves.

The popular tendency to ascribe peculiar virtues to peculiar natural objects, to regard with superstitious awe rare and unexplained phenomena, and to ascribe unusual marks on rocks and boulders to man's art, is as strong amidst the light of present scientific knowledge as it was a hundred years ago. While this is to be regretted, it has one feature for which we may be thankful. It leads men to call the attention of scientific workers to such objects. In this way specimens of much interest, and superstitions unthought of by people of intelligence, are brought to light, and opportunities thereby occur for correcting mistakes and destroying erroneous impressions. In the progress of knowledge much has already been done in this way. Belemnites have almost ceased to be regarded as thunderbolts; the mineralogist or the palæontologist has explained the marks which led to the use of certain stones as charms, or which associated claystone nodules with the fairies; the foot-like weathering in the rock is fast ceasing to be held the footprint of the *Wirrekow* (Satan); the tick of the harmless little brown beetle, *Anobium striatum*, is now seldom thought to be to the sick a premonition of death; and even the ash tree is fast losing its celebrity as alone among the trees in attracting lightning, from its supposed connection with ancient Norse worship. More than enough, however, of such beliefs still lingers among the people, not only in remote districts of the

country, but even in or near centres of business, enterprise, intellectual activity, and enlightening science. "You will have seen a witch's styddy?" was the query put to me in a populous country town, after a lecture on some antiquarian topics. At the time, though well acquainted with the district, I had not even heard of a witch's styddy or anvil, but I am now able to show to the Society the specimen of weathering which superstition had associated with "uncanny" art. Moreover, it suggests another aspect of the subject under notice, namely, the presence of so-called crescent symbols on rocks, and proves that some of these may be natural. About twenty years ago, Mr Gowans, our present Lord Dean of Guild, when working a contract for a mineral line of railway in the parish of Shotts, found himself much out in his estimate by the occurrence of a great glacial moraine, where he had counted on the deep boulder clay of the district. Many of the stones were of great size and weight, and both they and the surface over which some of them had been carried presented features of glacial action of the most marked and interesting kind, as the lump of rock now on the table shows. I wish, however, to refer only to the numerous crescent marks that occurred among them, and which explain those on the witch's styddy. While the boulders in the moraine were for the most part the trap of the district, there were limestone blocks among them, and at one place limestone formed the surface-floor over which they had been pushed. In this limestone many large fossil shells (*Productidæ*) were embedded, with their hinge distal to the surface and their edge appearing on it. The edges, deeply blunted by the rubbing, presented to the eye crescent shapes of a remarkably definite kind. Some of these had yielded to the carbonic acid in the rain water which had reached them, and assumed a well marked crescent *intaglio*. One side of the "styddy" shows the whole cavity which the *Productus* had filled, the other side only the hollow crescent, where the edge had been weathered before the weathering influence had attacked the body of the shell. But natural crescent-shapes are often met with, which are traceable to other causes. I show two of these on one slab, from the Forfarshire Old Red Sandstone, which are held by the people of the district in which they occur to be the footprints of horses. A glance at them will lead

most to excuse those who take up this extraordinary fancy. In shape and relative position to each other, the resemblance to pony footprints is most remarkable, one of them having a mark suggestive of the impress of the frog of the hoof. It is to be feared that some of the symbols of the moon-deity of the Chaldæans may be about as widely separated from Chaldæan mythology as pony footprints are from Old Red Sandstone time.

Two other classes of natural markings are shown which present strong temptations to observers to describe them as artificial. The one class is met with on soft micaceous sandstones, the other on large pieces of flint. The former are the pits made by the common or rock limpet (*Patella vulgata*), by means of its so-called lingual teeth, in sandstone, as in the specimen before us, or in rocks in which there is much lime—the creatures, no doubt, being much helped in making the pit by the action of the carbonic acid they disengage in respiration. That there should have been doubts expressed, whether a specimen in the Museum consists of much-worn interlaced work, or may only be deeply weathered limpet pits, is suggestive from our present point of view. The circles in the flints exhibited are perfect; but how they have been formed is not apparent. They are not artificial.

The matters touched in the foregoing remarks seem to me to warrant the following propositions:—

1. There is a large and exceedingly interesting group of rock-markings, chiefly in the form of cups and rings, with or without associated canals, which are undoubtedly the work of man.

2. They occur in the British Isles, on the Continent of Europe, in Asia, Africa, and both Americas.

3. Theories as to their origin, age, makers, and meaning are many, but the evidence in support of the several theories is not sufficient for legitimate inferences.

4. There are very many natural rock and stone markings strongly resembling these, which are to be traced to weathering agencies, assisted by the presence of foreign concretions in the rocks, and also by their mineral constituents.

5. As there is good reason to believe that these natural forms have

not unfrequently been described as artificial, it is of much importance to scientific archæology that observers should put on record the instances only of whose artificial character there can be no question.